



THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: KRIZAN

Serial No.: 09/975,806

Filed: October 11, 2001

Art Unit: 1755

Examiner: S. A. Manlove

Atty. Docket No.: ITOCHU P-1/500921.20001

**TITANIUM DIOXIDE  
PIGMENT COMPOSITION**

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

**BRIEF ON APPEAL**

Dear Sir:

This Brief is resubmitted in response to Examiner's Notification of Non-Compliance dated April 29, 2004. A Petition to Revive also accompanies this Brief. This Brief is submitted in support of the Appeal to the Board of Appeals from the Final Office Action mailed November 5, 2004.

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1. REAL PARTY IN INTEREST

The real party in interest in the above-identified application is Inventor, Jeffrey F. Krizan located at 133 Cobbler Lane, Southbury, CT 06488.

2. RELATED APPEALS AND INTERFERENCES

No interference is known to the Appellant, the Appellant's legal representative, or Assignee which will directly affect, be directly affected by or have a bearing on the Board's decision in this Appeal.

3. STATUS OF ALL CLAIMS

The above-identified application was filed on October 11, 2001, as the non-provisional application of Application Serial No. 60/240,190, filed October 11, 2000. The above-identified application was filed with original claims 1-22.

It is noted that in response to an Office Action mailed May 15, 2002, Applicant submitted an Amendment to the Office Action on August 15, 2002. In this Amendment, Applicant canceled claim 7, amended claims 1, 8, 9, 10, 12, 15 and 19 and added new claim 23. Applicant then received another Office Action mailed on November 5, 2002. On December 5, 2003, Applicant submitted an Amendment After Final Rejection. In the Amendment After Final Rejection, Applicant amended claim 9 to address Examiner's concerns by to replace the term "blanc fix" with the term "barium sulfate" and correcting typographical errors.

As a result, claims 1, 8-10, 12, 15, 19 and 23 are previously presented and claim 7 has been canceled. Claims 2-6, 11, 13, 14, 16-18 and 20-22 are original to the application. Thus, claims 1-6 and 8-23 remain in this application and the rejections thereof are hereby appealed.

#### 4. STATUS OF AMENDMENTS

All amendments have been entered.

#### 5. SUMMARY OF CLAIMED SUBJECT MATTER

TiO<sub>2</sub> is a white pigment having a high index of refraction and excellent light diffusing properties. It is generally found in two different crystalline forms, referred to as anatase and rutile. Both forms may be used as an opacifying agent for a variety of substrates. TiO<sub>2</sub> is problematic in that it is relatively expensive and exhibits the propensity to undergo autoflocculation, i.e., agglomeration both in the dry and wet states.

Barium sulfate is a white water insoluble compound which has also been used in pigment compositions. It does not, however, exhibit significant opacification properties on its own. For purposes of this Appeal Brief, the terms “opacity” and “opacifier” relate to the ability or property of being or rendering a substrate impervious to light rays so that it is not transparent.

The present inventor has discovered that the agglomeration difficulties with TiO<sub>2</sub> can be decreased by the use of a pre-prepared composition composed of titanium dioxide and barium sulfate wherein the amount of barium sulfate is sufficient to prevent the agglomeration of the TiO<sub>2</sub>. The inventor has also discovered that the addition of this amount of barium sulfate does not detract from the opacification properties of the TiO<sub>2</sub> and assist in providing brightness characteristics to the overall pigment composition.

In independent claim 1, Applicant claims a pigment composition comprising TiO<sub>2</sub> and a TiO<sub>2</sub> stabilizing and anti-agglomeration effective amount of barium sulfate wherein the amount of TiO<sub>2</sub> is in the range from about 65.0 to 95.0 percent by weight and the amount of barium sulfate is in the range from about 5.0 to 35.0 percent by weight, all weights being based on the weight of the total solids content of the composition. See paragraph [0017]. In claim 2, the barium sulfate is selected from natural barytes. See paragraph [0013]. The barium sulfate is synthetic blanc fixe in claim 3. See paragraph [0013]. In claim 4, the pigment composition of claim 1 is free of water and is in powder form. See paragraphs

[0016] and [0024]. The pigment composition of claim 1 further comprises water and is in the form of a slurry as disclosed in claim 5. See paragraph [0024]. In claim 6, the pigment composition of claim 5 having a total solids content in the range from about 65.0 to 80.0 percent by weight based on the total weight of the composition. See paragraph [0016]. The pigment composition of claim 1 where the amount of  $\text{TiO}_2$  is in the range from about 70.0 to 76.0 percent by weight and the amount of barium sulfate is in the range from about 30.0 to 24.0 percent by weight, all weights being based on the weight of the total solids content of the composition in disclosed in claim 8. See paragraph [0018]. Claim 9 discloses that the pigment composition of claim 1 comprises about 74.5 to 75.5% by weight  $\text{TiO}_2$ , and from about 24.5 to 25.5 % by weight barium sulfate, all percentages being based on the total solid contents of the composition. Support for this claim is shown, for example, at paragraph [0018].

Claim 10 discloses that the pigment composition of claim 1 further comprises an additive selected from the group consisting of defoamers, dispersants, biocides, pH adjustment agents and combinations thereof. See paragraph [0019]. The pigment composition of claim 10 where the additive is present in an amount from about 0.05 to 3.0 percent by weight based on the weight of the total solids of the composition is claimed in claim 11. See paragraph [0020]. Claim 12 claims the pigment composition of claim 11 where the additive is selected from the group consisting of dimethyl polysiloxane, octamethylcyclotetrasiloxane, anionic polyacrylate, polyglycolethers, fumed silica, petroleum hydrocarbons, acrylic polymers, triethanolamine, bicyclic oxazolidines, 1,2-benzisothiazolin-3-on, sodium hydroxide and combinations thereof. See paragraph [0021]. The pigment composition of claim 1 which comprises about 74.5 to 75.5 percent by weight of  $\text{TiO}_2$  and from about 24.5 to 25.5 percent by weight barium sulfate based on the weight of the total solids content of the composition is disclosed in claim 13. See paragraph [0022]. In claim 14, the composition of claim 13 is in the form of an aqueous slurry having a total solids content in the range from about 71.0 to 72.9 percent by weight based on the total weight of the composition. See paragraph [0022]. The composition of claim 14 having a pH of from about 7.0 to 10.0, a maximum 325 sieve residue in parts per million of 50, and a Brookfield viscosity of about 200 to 800 as measured with a #4 spindle at 100 rpm at ambient temperature is claimed in claim 15. See paragraph [0023].

Claim 16, 17, and 18 disclose a method for increasing the opacity of a substrate comprising adding an opacifying effective amount of the composition of claim 1, 5 and 13 to

the substrate, respectively. See paragraph [0024]. Claim 19 claims a method of claim 16 wherein the substrate is selected from the group consisting of paper, plastic, and coatings. See paragraph [0024]. In claim 20 and 21, a method of claim 19 wherein the substrate is in the form of a sheet or is plastic and is in the form of a shaped element is provided, respectively. See paragraph [0024]. Claim 22 claims paper, plastic or a coating containing an opacifying effective amount of the composition of claim 1. See paragraph [0024]. Lastly, independent claim 23 claims a pigment composition comprising  $\text{TiO}_2$  and a  $\text{TiO}_2$  stabilizing and anti-agglomeration effective amount of barium sulfate selected from the group consisting of natural barytes, wherein the amount of  $\text{TiO}_2$  is in the range from about 65.0 to 95.0 percent by weight and the amount of barium sulfate is in the range from about 5.0 to 35.0 percent by weight, all weights being based on the weight of the total solids content of the composition. See paragraph [0017].

#### 6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether Claim 9 is indefinite under 35 U.S.C. §112, second paragraph, because Claim 9 recites the term “blanc fix” in line 2 and there is insufficient antecedent basis for this term. In addition, dependency should be to claim 3 instead of claim 7 and the period after  $\text{TiO}_2$  should be deleted.
2. Whether Claims 1, 3, 4 and 10 are anticipated under 36 U.S.C. § 102 (b) over U.S. Patent No. 4,885,034 to Kreth et al (“Kreth”).
3. Whether Claims 8, 11, 13, 16 and 18-22 are unpatentable under 35 U.S.C. 103 (a) over U.S. Patent No. 4,885,034 to Kreth et al (“Kreth”).
4. Whether Claims 5, 6, 13-15 and 17 are unpatentable under 35 U.S.C. 103 (a) over U.S. Patent No. 4,885,034 to Kreth et al (“Kreth”) as applied to Claim 1 above, and further in view of U.S. Patent No. 3,549,396 to Dietz (“Dietz”).

5. Whether Claims 11, 12 and 17 are unpatentable under 35 U.S.C. 103 (a) over U.S. Patent No. 4,885,034 to Kreth et al ("Kreth") in view of U.S. Patent No. 2,212,629 to Alessandrone ("Alessandrone").

6. Whether Claims 1-5, 9-10 and 23 are unpatentable under 35 U.S.C. 103 (a) over U.S. Patent No. 4,885,034 to Kreth et al ("Kreth") in view of U.S. Patent No. 2,212,629 to Alessandrone ("Alessandrone").

## 7. ARGUMENT

*1. Whether Claim 9 is indefinite under 35 U.S.C. §112, second paragraph, because Claim 9 recites the term "blanc fix" in line 2 and there is insufficient antecedent basis for this term. In addition, dependency should be to claim 3 instead of claim 7 and the period after TiO<sub>2</sub> should be deleted.*

In regards to Issue 1 above, please note that this rejection was addressed in the Amendment After Final Rejection filed December 5, 2003 which obviates the formal rejections of Claim 9 as set forth in the Final Office Action.

*2. Whether Claims 1, 3, 4 and 10 are anticipated under 36 U.S.C. § 102 (b) over U.S. Patent No. 4,885,034 to Kreth et al ("Kreth").*

The Examiner has, in each rejection, relied on Kreth as the primary reference. The Examiner asserts that Kreth discloses a method for making a composite titanium dioxide pigment with barium sulfate and further that Kreth teaches the compositional ranges required by the present claim. However, it is submitted that this is a mischaracterization of Kreth with respect to its relevance to the present claims. More particularly, Kreth is directed to a method for producing a composite TiO<sub>2</sub> pigment. In the composite TiO<sub>2</sub> pigment, the pigment is

prepared by taking a suspension of metatitanic acid which contains free and combined sulfuric acid and has been purified to remove chromophoric elements. This suspension is neutralized by the addition of calcium oxide and/or barium oxide in quantities which are stoichiometric with respect to the total sulfate. The calcium sulfate and/or barium sulfate is precipitated in an intimate mixture with the metatitanic acid and the co-precipitate is separated and dried. Consequently, this particular combination as produced by this method does not only contain barium sulfate and titanium oxide. Rather, because of the method used, mixture is obtained which constitutes titanium dioxide and barium sulfate obtained by a chemical process resulting in a particular intimate mixture of the two materials having certain particle size ranges.

This is unlike the present invention claimed which requires only the presence of titanium dioxide and barium sulfate in an amount effective to stabilize and avoid agglomeration of the  $\text{TiO}_2$ . Kreth discloses a relatively large number of materials which can be mixed with the titanium oxide hydrate, for example, calcium oxide, calcium hydroxide, calcium carbonate, barium oxide, barium hydroxide, barium carbonate as well as mixtures thereof. Kreth further discloses a rather complicated process for producing the resulting composite. Certainly, there is nothing in this reference which suggests that barium sulfate would have any anti-agglomeration or stabilizing effect on the  $\text{TiO}_2$ . In addition, the reference requires that the specific process disclosed to produce the disclosed composite so that specific particle size ranges and intimate mixture of the materials can be obtained. It is submitted that Kreth does not anticipate nor render the present invention obvious as set forth in the claims and this rejection should not be sustained.

3. *Whether Claims 8, 11, 13, 16 and 18-22 are unpatentable under 35 U.S.C. 103 (a) over U.S. Patent No. 4,885,034 to Kreth et al ("Kreth").*

See the argument for Issue 2 above.

4. *Whether Claims 5, 6, 13-15 and 17 are unpatentable under 35 U.S.C. 103 (a) over U.S. Patent No. 4,885,034 to Kreth et al ("Kreth") as applied to Claim 1 above, and further in view of U.S. Patent No. 3,549,396 to Dietz ("Dietz").*

See the argument for Issue 2 above in regards to Kreth.

Dietz does not cure the deficiencies of Kreth. This reference adds nothing to make Kreth more relevant to the invention as claimed. Consequently, the rejection of these claims as being obvious based on the various combinations of the cited references is untenable and should be also not be sustained. There is simply no linking disclosure between the references that makes the obviousness rejection thereon sustainable and this rejection should not be sustained. The rejection of the claims on appeal based on this combination of references should be reversed.

5. *Whether Claims 11, 12 and 17 are unpatentable under 35 U.S.C. 103 (a) over U.S. Patent No. 4,885,034 to Kreth et al ("Kreth") in view of U.S. Patent No. 2,212,629 to Alessandroni ("Alessandroni").*

See the argument for Issue 2 above in regards to Kreth.

Alessandroni does not cure the deficiencies of Kreth. This reference adds nothing to make Kreth more relevant to the invention as claimed. Consequently, the rejection of these claims as being obvious based on the various combinations of the cited references is untenable and should be also not be sustained. There is simply no linking disclosure between the references that makes the obviousness rejection thereon sustainable and this rejection should not be sustained. The rejection of the claims on appeal based on this combination of references should be reversed.

6. *Whether Claims 1-5, 9-10 and 23 are unpatentable under 35 U.S.C. 103 (a) over U.S. Patent No. 4,885,034 to Kreth et al ("Kreth") in view of U.S. Patent No. 2,212,629 to Alessandroni ("Alessandroni").*



See the argument for Issue 2 above in regards to Kreth.

Alessandroni does not cure the deficiencies of Kreth. This reference adds nothing to make Kreth more relevant to the invention as claimed. Consequently, the rejection of these claims as being obvious based on the various combinations of the cited references is untenable and should be also not be sustained. There is simply no linking disclosure between the references that makes the obviousness rejection thereon sustainable and this rejection should not be sustained. The rejection of the claims on appeal based on this combination of references should be reversed.

#### 8. CLAIMS APPENDIX

Claim 1 (Previously presented): A pigment composition comprising  $\text{TiO}_2$  and a  $\text{TiO}_2$  stabilizing and anti-agglomeration effective amount of barium sulfate wherein the amount of  $\text{TiO}_2$  is in the range from about 65.0 to 95.0 percent by weight and the amount of barium sulfate is in the range from about 5.0 to 35.0 percent by weight, all weights being based on the weight of the total solids content of the composition.

Claim 2 (Original): The composition of claim 1 wherein the barium sulfate is selected from the group consisting of natural barytes.

Claim 3 (Original): The composition of claim 1 wherein the barium sulfate is synthetic blanc fixe.

Claim 4 (Original): The pigment composition of claim 1 which is free of water and is in powder form.

Claim 5 (Original): The pigment composition of claim 1 which further comprises water and is in the form of a slurry.

Claim 6 (Original): The pigment composition of claim 5 having a total solids content in the range from about 65.0 to 80.0 percent by weight based on the total weight of the composition.

Claim 7 (Canceled).

Claim 8 (Previously presented): The pigment composition of claim 1 wherein the amount of  $\text{TiO}_2$  is in the range from about 70.0 to 76.0 percent by weight and the amount of barium sulfate is in the range from about 30.0 to 24.0 percent by weight, all weights being based on the weight of the total solids content of the composition.

Claim 9 (Previously presented): The pigment composition of claim 1 which comprises about 74.5 to 75.5% by weight  $\text{TiO}_2$ , and from about 24.5 to 25.5 % by weight barium sulfate, all percentages being based on the total solid contents of the composition.

Claim 10 (Previously presented): The pigment composition of claim 1 wherein the composition further comprises an additive selected from the group consisting of defoamers, dispersants, biocides, pH adjustment agents and combinations thereof.

Claim 11 (Original): The pigment composition of claim 10 wherein the additive is present in an amount from about 0.05 to 3.0 percent by weight based on the weight of the total solids of the composition.

Claim 12 (Previously presented): The pigment composition of claim 11 wherein the additive is selected from the group consisting of dimethyl polysiloxane, octamethylcyclotetrasiloxane, anionic polyacrylate, polyglycolethers, fumed silica, petroleum hydrocarbons, acrylic polymers, triethanolamine, bicyclic oxazolidines, 1,2-benzisothiazolin-3-on, sodium hydroxide and combinations thereof.

Claim 13 (Original): The pigment composition of claim 1 which comprises about 74.5 to 75.5 percent by weight of  $\text{TiO}_2$  and from about 24.5 to 25.5 percent by weight barium sulfate based on the weight of the total solids content of the composition.

Claim 14 (Original): The composition of claim 13 in the form of an aqueous slurry having a total solids content in the range from about 71.0 to 72.9 percent by weight based on the total weight of the composition.

Claim 15 (Previously presented): The composition of claim 14 having a pH of from about 7.0 to 10.0, a maximum 325 sieve residue in parts per million of 50, and a Brookfield viscosity of about 200 to 800 as measured with a #4 spindle at 100rpm at ambient temperature.

Claim 16 (Original): The method for increasing the opacity of a substrate comprising adding an opacifying effective amount of the composition of claim 1 to the substrate.

Claim 17 (Original): A method for increasing the opacity of a substrate comprising adding an opacifying effective amount of the composition of claim 5 to the substrate.

Claim 18 (Original): A method for increasing the opacity of a substrate comprising: adding an opacifying effective amount of the composition of claim 13 to the substrate.

Claim 19 (Previously presented): The method of claim 16 wherein the substrate is selected from the group consisting of paper, plastic, and coatings.

Claim 20 (Original): The method of claim 19 wherein the substrate is in the form of a sheet.

Claim 21 (Original): The method of claim 19 wherein the substrate is plastic and is in the form of a shaped element.

Claim 22 (Original): Paper, plastic or a coating containing an opacifying effective amount of the composition of claim 1.

Claim 23 (Previously presented): A pigment composition comprising  $\text{TiO}_2$  and a  $\text{TiO}_2$  stabilizing and anti-agglomeration effective amount of barium sulfate selected from the group consisting of natural barytes, wherein the amount of  $\text{TiO}_2$  is in the range from about

65.0 to 95.0 percent by weight and the amount of barium sulfate is in the range from about 5.0 to 35.0 percent by weight, all weights being based on the weight of the total solids content of the composition.

9. CONCLUSION

In view of the foregoing, it is submitted that the final rejection of the Examiner based on the art of record is improper. Accordingly, it is requested that this Board reverse the rejection raised by the Examiner.

Respectfully submitted,

Dated: September 22, 2004

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